body to belong to the same class as the sulpho-cyanic and ferro-cyanic acids, which are either not poisonous at all, or very feebly so, and differ in that respect most materially from cyanogen itself, and its other well known compounds.

Cyanogen.—Professor Hünefeld conceives that no experiments have yet been made on the physiological properties of this gas. But here he is mistaken. *Coullon* ascertained some time ago that it is very poisonous to all the lower animals, in whom it produces sometimes pure coma, sometimes convulsions also, (Journ. Universel. des Sc. Méd. ii. 240;) and *Drs. Turner* and *Christison* ascertained, that in very minute quantity it acts powerfully as a narcotic on plants, (Edin. Med. and Surg. Journal, xxviii. 363.) The experiments of Hünefeld are confirmatory of the results now mentioned. He placed a rabbit in a pneumatic trough, into the bottom of which the gas was introduced, while the top was covered by pasteboard. In a few minutes it became restless, and breathed anxiously; in four or five minutes slight convulsions supervened, feces were discharged, the tongue was protruded, the eyes became stiff, and the pupils dilated; and the animal threw back its head and appeared stupefied. In the course of five or six minutes it uttered some cries and expired. Being then removed into the open air, it was found impossible to effect resuscitation. When the body was examined, the eyes were found unusually glistening, the muscles flaccid, the abdomen distended and tense, the stomach, intestines, liver, heart, and lungs healthy, the brain healthy, and not gorged; and there was not any perceptible odour of cyanogen gas.

Phosphorous acid.—Twenty-five grains of this substance carefully prepared were administered to an adult rabbit. For an hour it appeared a little restless, and would not eat, but soon afterwards it became apparently quite well. In twenty-four hours a drachm was given diluted with a little water; after which the breathing became speedily difficult, and in the course of fifteen or thirty minutes the animal was restless and anxious, yet averse to motion. In ten or twelve hours it vomited a sanguinolent fluid, and then expired in slight convulsions. The villous coat of the stomach was brownish-red near the cardia alone. There was very little phosphorous acid in its cavity; but its contents had a strong acid reäction, owing to the presence of muriatic acid. The abdomen and other bowels were quite healthy, as also the liver and bile, which did not contain any of the poison. The lungs and heart were gorged with blood, the spleen also gorged and very red, the brain natural, the kidneys natural, and without acid reäction. Nowhere was there any smell of phosphorus. The urine was strongly impregnated with phosphoric acid, as appeared from the action of ammonia and sulphate of magnesia. The uterus was very red, and in the vagina a bloody fluid was found. Hence, this substance appears not to be a very active poison, and to operate not so much by irritating the alimentary canal as by inducing some remote effects. It is not improbable that it possesses the special property of irritating the uterine system.—*Ed. Med. and Surg. Journ. from Horn's Archiv. für Medizinische, Erfahrung, Sept. and Oct.* 1831.

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45. *Crystallization of Perchloric Acid.*—M. Serullas states that the perchloric acid may be always crystallized by pursuing the following plan. Sulphuric and perchloric acid are to be successively introduced into a small retort, through a long tube; the beak of the retort is to be inserted into a tube curved and drawn to a fine point at the other extremity. Heat is to be applied, and when the liquid boils, and is kept in this state for some time, over a small fire, it will be seen to pass over into the tube and solidify there; the tube is to be kept cool with water; thick white fumes escape at the small end of it. The operation must be stopped before the mixture is discoloured, and as soon as any liquid passes over, which does not congeal. The experiment should always be performed with small quantities of the perchloric acid, say eight to ten drachms.

Liquid perchloric acid may be concentrated by evaporation in a capsule, or what is better, in a small retort. The first portions that pass over are to be thrown away, as they are only water. M. Serullas has obtained it of the density of 1.65.—*Journ. de Chim. Med. and Journ. Phil. Col. Pharmacy*, 1832.

46. *Hydrocyanic Acid.*—M. Tilloy has succeeded in preparing a medicinal hydrocyanic acid, the effects of which do not vary, and which can be preserved for several years, without any sensible alteration; this is

Cyanide of mercury	1 part,
Distilled water	4 parts,
Alcohol at 36° Baume	4 parts.

Dissolve the cyanide of mercury in the water, by aid of heat, and then mix it with the alcohol; add a very slight excess of hydro-sulphuric acid; throw in subcarbonate of lead; agitate several times, and distil in a water bath, so as to obtain all the alcohol saturated with the hydrocyanic acid.—*Ibid.*

47. *Cyanide of Potassium.*—According to M. Chevallier no work hitherto published contains an exact process for obtaining the cyanide of potash in a pure state. The usual plan is to calcine the ferro-hydrocyanate of potassa, then to dissolve it in distilled water, filter and evaporate to dryness. The procedure is impracticable, for the cyanide of potassa decomposes water on coming in contact with it. The result, therefore, would be hydrocyanate of potassa, and in heating this all the hydrocyanic acid escapes, and the residue will be merely potassa.

I have prepared this salt by calcining the ferro-hydrocyanate of potassa, then separating the cyanide of potassa from the quadricarburet of iron by pure alcohol, on distilling which, cyanide of potassa is obtained very pure and white.—*Ibid.*

48. *Perchloric Acid as a test for the Mineral Alkalies.*—From a paper on this subject by M. Serullas, it appears, that if a few drops of perchloric acid be added to a solution of potash and soda, a precipitate of perchlorate of potash is instantly formed, the perchlorate of soda, or the soda, if there be not an excess of acid used, remains in solution, whence they can be separated by concentrated alcohol, which, at the same time precipitates the small quantity of perchlorate of potash held in solution. A solution of perchlorate of soda, on the addition of potash, lets fall a precipitate of perchlorate of potash. When perchloric acid is added to solutions of the sulphate, nitrate, hydrochlorate, bromate, hydrobromate or hydriodate of potash, it forms a precipitate and the acids become free, and may be separated by means of concentrated alcohol. From these experiments it appears, that the perchloric acid forms an almost insoluble salt with potash, requiring to dissolve it more than sixty times its weight of water at 15 + 0. 2. That soda forms a very deliquescent salt, exceedingly soluble in water and concentrated alcohol. 3. That the perchlorate of potash, on the contrary, is insoluble in alcohol. Finally, that by means of perchloric acid, the salts of potash may be decomposed, and the acid separated.—*Ibid.*

49. *Protoxide of Copper.*—The most simple and easy mode of obtaining the protoxide of copper in a pure state, is the following. The copper is to be dissolved in hydrochloric acid, to which are to be gradually added small portions of nitric acid; the solution is then to be evaporated to dryness, and the residuum heated to fusion; it is thus transformed into a brown crystalline chloride. It is now to be melted with anhydrous carbonate of soda, in the proportion of ten parts of the former to six of the latter, in a covered crucible and at a low red heat. The mass is to be treated with water to dissolve the chloride of iodium that has formed; the protoxide of copper separates in the form of a beautiful red powder, which is to be washed and dried. If sal ammoniac be added to the above mentioned mixture, the whole chloride is reduced, as may readily be supposed, and separates in a spongy form, when the mass is mingled with water.—*Ibid.*